

## REMARKS

Applicant greatly appreciates the courtesies extended to the undersigned by the Examiner during the telephone interview of April 26, 2005. An Interview Summary accompanies this response.

Applicant hereby adds claims 83-100. Accordingly, claims 21-30 and 61-100 are pending in the present application.

Claims 21-30, and 61-82 stand rejected under 35 USC 102 for anticipation by U.S. Patent No 5,960,276 to Liaw et al.

Applicant respectfully traverses the rejection and urges allowance of the present application.

Referring to the 102 rejections over Liaw, Applicant respectfully submits that the reference fails to provide an enabling disclosure at least with respect to the teachings relied upon in support of the 102 rejection and accordingly the anticipation rejection is improper for at least this reason. In particular, the teachings of the table in col. 4 and Fig. 4 of Liaw are identified as allegedly teaching limitations of the claims concerning the active area widths and the respective relationships with threshold voltages. However, specific explicit teachings of Liaw concerning "channel length" and "channel width" are directly contradictory with one another. Applicant respectfully submits this contradiction precludes the public from being in possession of the limitations of Applicant's claims based upon Liaw before Applicant's filing date and the claims are allowable for at least this reason.

Applicants note the requirements of MPEP §2121.01 (8th ed., rev. 2), entitled "Use of Prior Art in Rejections Where Operability Is In Question". This MPEP section

states that in determining that quantum of prior art disclosure which is necessary to declare an applicant's invention 'not novel' or 'anticipated' within section 102, the stated test is whether a reference contains an 'enabling disclosure'. In re Hoeksema, 399 F.2d 269, 158 USPQ 596 (CCPA 1968). A reference contains an "enabling disclosure" if the public was in possession of the claimed invention before the date of invention. MPEP 2121.01 further provides that such possession is effected if one of ordinary skill could have combined the publication's description with his or her own knowledge to make the claimed invention.

The contradiction of the Liaw teachings concerning channel width and channel length is evident by the reference in Liaw to *different dimensions using the same terms*. More specifically, at col. 3, lines 20+ of Liaw, it is stated that reference 12N of Liaw is a channel width (and corresponding to an X axis direction in the corresponding plan view of Fig. 3B). However, with reference to Fig. 3B and col. 4, lines 5+, Liaw sets forth a *directly contrary definition of channel width* by stating that reference 42 (a dimension in the Y axis direction) is the channel width. In no fair interpretation may the directly contrary teachings of "channel width" to both the X and Y axes dimensions at different portions of the same disclosure be considered to provide the public with "possession" of the claimed subject matter.

More specifically, if the teachings of Liaw regarding channel width are interpreted in accordance with at least one explicit portion of the disclosure of Liaw, the reference does not disclose limitations of the pending claims.

For example, if the interpretation of channel width is defined as corresponding to reference 42 as defined in col. 4, lines 1+ as a Y axis dimension, then the teachings of

Table and Fig. 4 fail to teach voltage thresholds increasing with active area widths as defined in the claims (e.g., in such an interpretation the dimension "L" would be the X axis dimension and it is clear that for common channel widths, the larger dimension "L" has a smaller voltage threshold than the smaller dimension "L" regardless of whether the Boron implant is provided or not as indicated by "w/i imp" or "w/o imp").

During the interview, the Examiner stated that the dimension 12N of Fig. 3A corresponds to the channel width. However, the Office provides no clarification or explanation as to why the explicit teachings of Liaw that reference 42 of Fig. 3B is the channel width are to be disregarded. It appears that the only rationale for the Office's interpretation of the contradictory teachings of Liaw is to support the anticipation rejection. However, the contradictory teachings of Liaw fail to provide one of skill in the art with possession of the claimed subject matter and is not an enabling disclosure as set forth by the MPEP. Applicants request withdrawal of the 102 rejections over Liaw for at least the above-mentioned compelling reasons.

Referring to claim 21, the method recites the one series being formed to have active area widths less than one micron to achieve lower threshold voltages than the other of the series having active area widths greater than one micron. The Liaw reference teachings regarding at least this limitation are ambiguous as set forth above and the Office has failed to establish a proper anticipation rejection. Applicants respectfully request withdrawal of the anticipation rejection of claim 21 over Liaw for at least this reason.

The claims which depend from independent claim 21 are in condition for allowance for the reasons discussed above with respect to the independent claim as

well as for their own respective features which are neither shown nor suggested by the cited art.

Referring to claim 22, Liaw fails to teach or suggest the threshold voltages for the two series of field effect transistors are defined by a common channel implant and claim 22 is allowable for at least this reason. The teachings in col. 3, lines 30-45 of Liaw relied upon by the Office are concerned with *implanting Boron into the trenches of the NMOS*. As set forth in col. 1, lines 42+ of Liaw, the Boron implant is performed to reduce and control the NMOS reverse narrow width effect in narrow active areas. Further, it is stated that the Boron is implanted into the trenches and at col. 3, lines 50+ provides that the Boron may be diffused along the trenches up to the surface of the Active areas. Such teachings fail to disclose the limitations of claim 22.

First, as set forth above, the teachings relied upon by the Office as allegedly disclosing the claimed *common channel implant* clearly indicate that the Boron is implanted into the trenches (as indicated by reference 44 of Fig. 2) and Liaw is void of teaching that Boron is implanted into the active areas 12N or 12W. In fact, *barrier layer 22 is provided over the active areas of Liaw during the implanting of Boron*. The implanting of Boron into the trenches may not be fairly interpreted to disclose or suggest the claimed common channel implant. In addition, any diffusion does not teach the threshold voltages being defined by a common channel implant. Claim 22 is allowable for at least this reason.

Referring to claim 23, and as mentioned above, the Boron implant is implanted into the trenches and fails to disclose the claimed *common channel implant* and claim 23 is allowable for at least this reason.

In addition, Applicants have failed to uncover teachings in Liaw as to how the threshold voltages of the transistors are defined let alone the specifically claimed use of a common channel implant. Liaw is concerned with implanting of Boron to reduce and control NMOS reverse narrow width effect in narrow active areas. It is mentioned that the B doped *trench sidewall regions 44* significantly *increase* the  $V_t$  especially at small channel widths. Liaw does not teach how the threshold voltages are defined and merely discloses Boron may increase the voltage thresholds. Liaw does not disclose how the voltage thresholds are defined in the first instance but merely refers to reduction and control of the reverse narrow width effect problem using the Boron. Even if Boron is considered to disclose a channel implant (contrary to the explicit teachings of Liaw) there is no evidence of record to support a position that the implanting of Boron is the only channel implant which defines the threshold voltages. Claim 23 is allowable for this additional reason.

Further with respect to dependent claim 23, Applicant discussed the table and Fig. 4. and noted that regardless of whether L or channel width is read to correspond to Applicant's active area widths, the only teachings of decreasing  $V_{th}$  relative to decreasing channel width are for the triangles and squares *not having the Boron implant* and accordingly fail to disclose the limitations of claim 23 which defines the common channel implant.

Referring to claim 64, the implanting of Boron into the trenches fails to disclose or suggest the *common channel implant* into the active areas of the transistors of the transistors of the two series. Claim 64 is allowable for this additional reason.

Referring to claim 65, there is no evidence of record that Boron in the *only*

*channel implant* which defines the different threshold voltages of the transistors of the two series. Claim 65 is allowable for this additional reason.

Referring to claim 66, the diffusion of Boron of Liaw fails to disclose or suggest the *implanting of the impurity into the active areas* of the transistors as claimed. Subsequent diffusion of Boron does not teach the channel implanting. Claim 66 is allowable for this additional reason.

Referring to claim 81, the conflicting teachings of channel widths of Liaw corresponding to both the X and Y axes directions in different portions of Liaw renders the reference ambiguous and fails to teach or suggest the specifically defined widths as being dimensions between plural shallow trench isolation regions. Liaw fails to provide an enabling disclosure with respect to the limitations of claim 81 read in conjunction with the limitations of the respective independent claim 21 and claim 81 is allowable for at least this reason.

Referring to claim 26, Liaw is not enabled with respect to disclosing the *first series of transistors having the active area widths less than the active areas widths of the second series of transistors and the threshold voltages of the transistors of the first series are less than the threshold voltages of the transistors of the second series*. More specifically, the teachings regarding the relationship of threshold voltages with respect to channel widths are conflicting in Liaw and one of skill in the art cannot be considered to be in possession of the subject matter of such teachings in view of the contradiction. Applicants respectfully submit that the anticipation rejection is improper for at least this reason.

In addition with respect to claim 26, apart from a cursory statement that Boron

has the effect of increasing voltage thresholds of the transistors in col. 4, Applicant has failed to uncover any teachings in Liaw regarding how the threshold voltages are defined. Specifically, Applicant has failed to uncover teachings in Liaw regarding *achieving different threshold voltages by varying the active area widths*. Applicant respectfully submits the above-recited limitations of claim 26 are not disclosed nor suggested by the prior art and Applicant requests allowance of claim 26 for at least this reason.

In addition, the Office has failed to identify teachings of the prior art which allegedly disclose the above-recited limitations. The Office on page 3 of the Action refers to Fig. 4. However, *Fig. 4 merely reflects the results of what the threshold voltages are and does not teach how the **threshold voltages are achieved**, let alone the specifically claimed achieving different threshold voltages by **varying the active area widths** as defined by Applicant in claim 26.*

Accordingly, in the event that a rejection of the claims is maintained with respect to the prior art, or a new rejection made, Applicants respectfully request identification *in a non-final action* of elements which allegedly correspond to limitations of the claims in accordance with 37 C.F.R §1.104(c)(2). In particular, 37 C.F.R §1.104(c)(2) provides that *the pertinence of each reference, if not apparent, must be clearly explained and each rejected claim specified*. Further, 37 C.F.R. §1.104(c)(2) states that the Examiner must cite the best references at their command. *When a reference is complex or shows or describes inventions other than that claimed by Applicants, the particular teachings relied upon must be designated as nearly as practicable*. Applicants respectfully request clarification of the rejections with respect to specific references and specific

reference teachings therein pursuant to 37 C.F.R. §1.104(c)(2) in a *non-final Action* if the claims are not found to be allowable.

The claims which depend from independent claim 26 are in condition for allowance for the reasons discussed above with respect to the independent claim as well as for their own respective features which are neither shown nor suggested by the cited art.

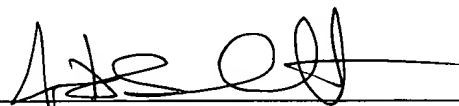
Applicant hereby adds new claims 83-100 which are supported at least by the teachings in Figs. 1-4 and the associated specification teachings of the originally filed application.

Applicant respectfully requests allowance of all pending claims.

The Examiner is requested to phone the undersigned if the Examiner believes such would facilitate prosecution of the present application. The undersigned is available for telephone consultation at any time during normal business hours (Pacific Time Zone).

Respectfully submitted,

4/28/05  
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Date

  
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